

Claims - amended 22.11.1004

1. Chewing gum comprising at least two different biodegradable polymers, wherein said at least two different biodegradable polymers have a different glass transition temperature T_g.
2. Chewing gum according to claim 1, wherein the at least two different polymers are hydrophilic.
3. Chewing gum according to claim 1 or 2, wherein the difference in molecular weight between the at least two different polymers is at least 1000 g/mol M_n.
4. Chewing gum according to any of the claims 1 - 3, wherein the difference in molecular weight between the at least two different polymers is at least 50000 g/mol M_n.
5. Chewing gum according to any of the claims 1 - 4, wherein at least one of said at least two different biodegradable polymers comprises a biodegradable elastomer and at least one of said at least two different biodegradable polymers comprises a biodegradable plasticizer, said biodegradable plasticizer comprising at least one biodegradable polymer.
6. Chewing gum according to any of the claims 1 - 5, wherein the molecular weight of said biodegradable plasticizer is in the range of 500 - 19.000 g/mol, preferably within the range of 1.500 - 9.000 g/mol M_n.
7. Chewing gum according to any of the claims 1 - 6, wherein at least one of the applied biodegradable polymers, preferably a plasticizer, has a glass transition of at least +1°C.

8. Chewing gum according to any of the claims 1 – 7,
wherein at least one of the applied biodegradable polymers, preferably a plasticizer,
has a glass transition of at least +10°C.

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9. Chewing gum according to any of the claims 1 – 8,
wherein at least one of the applied biodegradable polymers, preferably a plasticizer,
has a glass transition of at least +20°C.

10 10. Chewing gum according to any of the claims 1 – 9,
wherein at least one of the applied biodegradable polymers comprises a
biodegradable elastomer.

11. Chewing gum according to any of the claims 1 – 10,
15 wherein the molecular weight of said biodegradable elastomer is in the range of
10000 - 1000000 g/mol Mn, preferably within the range of 30000 - 250000 g/mol
Mn.

12. Chewing gum according to any of the claims 1 – 11,
20 wherein at least one of the at least two different biodegradable polymers has a glass
transition temperature of less than 0 °C.

13. Chewing gum according to any of the claims 1 – 12,
wherein at least one of the at least two different biodegradable polymers has a glass
25 transition temperature of less than -30°C, preferably less than -50°C

14. Chewing gum according to any of the claims 1 – 13,
wherein the resulting chewing gum has at least two different glass transitions
temperatures Tg.

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15. Chewing gum according to any of the claims 1 – 14,
wherein the chewing gum comprises

at least one biodegradable elastomer having a glass transition temperature T_g below 0°C and

at least one biodegradable plasticizer having a glass transition temperature T_g exceeding 0°C .

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16. Chewing gum according to any of the claims 1-15, wherein the at least one plasticizer comprises a biodegradable polymer obtained by polymerization of one or more cyclic esters.

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17. Chewing gum according to any of the claims 1-16, wherein the at least one elastomer comprises a biodegradable polymer obtained by polymerization of one or more cyclic esters.

18. Chewing gum according to any of the claims 1-17,

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wherein the at least one elastomer comprises edible polyesters.

19. Chewing gum according to any of the claims 1-18,

wherein the at least one elastomer comprises edible polyesters or polyhydroxyalkanoates.

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20. Chewing gum according to any of the claims 1-19,

wherein said chewing gum comprises

at least one biodegradable elastomer in the amount of about 0.5 to about 70% wt of the chewing gum,

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at least one biodegradable plasticizer in the amount of about 0.5 to about 70% wt of the chewing gum and

at least one chewing gum ingredient chosen from the groups of softeners, sweeteners, flavoring agents, active ingredients and fillers in the amount of about 2 to about 80% wt of the chewing gum.

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21. Chewing gum according to any of the claims 1 to 20,

wherein the at least one biodegradable polymer comprises at least 25% of the chewing gum polymers, preferably at least 50%.

22. Chewing gum according to any of the claims 1 to 21,
5 wherein all the biodegradable polymers comprised in the chewing gum comprise at least 25%, preferably at least 50% of the chewing gum polymers.

23. Chewing gum according to any of the claims 1 to 22,
wherein all the biodegradable polymers comprised in the chewing gum comprise at
10 least 80%, preferably at least 90% of the chewing gum polymers.

24. Chewing gum according to any of the claims 1 to 23,
wherein the chewing gum is substantially free of non-biodegradable polymers.

- 15 25. Chewing gum according to any of the claims 1 to 24,
wherein the chewing gum is free of non-biodegradable polymers.

26. Chewing gum according to any of the claims 1- 25,
wherein said chewing gum ingredients comprise flavoring agents.

- 20 27. Chewing gum according to any of the claims 1- 26,
wherein said flavoring agents comprise natural and synthetic flavorings in the form of natural vegetable components, essential oils, essences, extracts, powders, including acids and other substances capable of affecting the taste profile.

- 25 28. Chewing gum according to any of the claims 1-27,
wherein said chewing gum comprises flavor in the amount of 0.01 to about 30 wt %, said percentage being based on the total weight of the chewing gum.

- 30 29. Chewing gum according to any of the claims 1-28,
wherein said chewing gum comprises flavor in the amount of 0.2 to about 4 wt %, said percentage being based on the total weight of the chewing gum.

30. Chewing gum according to any of the claims 1- 29,
wherein said flavor comprises water soluble ingredients.
- 5 31. Chewing gum according to any of the claims 1-30,
wherein said water soluble flavor comprises acids.
32. Chewing gum according to any of the claims 1-31,
wherein said flavor comprises water insoluble ingredients.
- 10 33. Chewing gum according to any of the claims 1- 32,
wherein said chewing gum ingredients comprise sweeteners.
34. Chewing gum according to any of the claims 1-33,
15 wherein said sweetener comprises bulk sweeteners.
35. Chewing gum according to any of the claims 1-34,
wherein the chewing gum comprises bulk sweeteners in the amount of about 5 to
about 95% by weight of the chewing gum, more typically about 20 to about 80% by
20 weight of the chewing gum.
36. Chewing gum according to any of the claims 1-35,
wherein said sweetener comprises high intensity sweeteners.
- 25 37. Chewing gum according to any of the claims 1-36,
wherein the high intensity sweeteners comprise sucralose, aspartame, salts of
acesulfame, alitame, saccharin and its salts, cyclamic acid and its salts, glycyrrhizin,
dihydrochalcones, thaumatin, monellin, sterioside, alone or in combination
- 30 38. Chewing gum according to any of the claims 1-37,

wherein the chewing gum comprises high intensity sweeteners in the amount of about 0 to about 1% by weight of the chewing gum, more typically about 0.05 to about 0.5 % by weight of the chewing gum.

- 5 39. Chewing gum according to any of the claims 1- 38,
wherein the chewing gum comprises at least one softener.

40. Chewing gum according to any of the claims 1- 39,
wherein the at least one softener comprises tallow, hydrogenated tallow,
10 hydrogenated and partially hydrogenated vegetable oils, cocoa butter, glycerol monostearate, glycerol triacetate, lecithin, mono-, di- and triglycerides, acetylated monoglycerides, fatty acids - such as stearic, palmitic, oleic and linoleic acids, waxes, PGE and mixtures thereof.

- 15 41. Chewing gum according to any of the claims 1- 40,
wherein the chewing gum comprises softeners in the amount of about 0 to about 18% by weight of the chewing gum, more typically about 0 to about 12 % by weight of the chewing gum.

- 20 42. Chewing gum according to any of the claims 1- 41,
wherein said chewing gum ingredients comprise active ingredients.

43. Chewing gum according to any of the claims 1- 42,
said active ingredients being selected from the group of: Acetaminophen,
25 Acetylsalicylsyre Buprenorphine Bromhexin Celcoxib Codeine, Diphenhydramin, Diclofenac, Etoricoxib, Ibuprofen, Indometacin, Ketoprofen, Lumiracoxib, Morphine, Naproxen, Oxycodon, Parecoxib, Piroxicam, Pseudoefedrin, Rofecoxib, Tenoxicam, Tramadol, Valdecocix, Calciumcarbonat, Magaldrate, Disulfiram, Bupropion, Nicotine, Azithromycin, Clarithromycin, Clotrimazole, Erythromycin,
30 Tetracycline, Granisetron, Ondansetron, Prometazin, Tropisetron, Brompheniramine, Ceterizin, Ieco-Ceterizin, Chlorcyclizine, Chlorpheniramin, Chlorpheniramin, Difenhydramine, Doxylamine, Fenofenadin, Guaifenesin, Loratidin, des-Loratidin,

- Phenyltoloxamine, Promethazin, Pyridamine, Terfenadin, Troxerutin, Methyl dopa, Methylphenidate, Benzalcon. Chloride, Benzeth. Chloride, Cetylpyrid. Chloride, Chlorhexidine, Ecabet-sodium, Haloperidol, Allopurinol, Colchicine, Theophylline, Propanolol, Prednisolone, Prednisone, Fluoride, Urea, Miconazole, Actot,
- 5 Glibenclamide, Glipizide, Metformin, Miglitol, Repaglinide, Rosiglitazone, Apomorphin, Cialis, Sildenafil, Vardenafil, Diphenoxylate, Simethicone, Cimetidine, Famotidine, Ranitidine, Ratinidine, cetrizin, Loratadine, Aspirin, Benzocaine, Dextrometorphan, Ephedrine, Phenylpropanolamine, Pseudoephedrine, Cisapride, Domperidone, Metoclopramide, Acyclovir, Dioctylsulfosucc., Phenolphthalein,
- 10 Almotriptan, Eletriptan, Ergotamine, Migea, Naratriptan, Rizatriptan, Sumatriptan, Zolmitriptan, Aluminium salts, Calcium salts, Ferro salts, Silver salts, Zinc-salte, Amphotericin B, Chlorhexidine, Miconazole, Triamcinolonacetoneid, Melatonin, Phenobarbital, Caffeine, Benzodiazepiner, Hydroxyzine, Meprobamate, Phenothiazine, Buclizine, Brometazine, Cinnarizine, Cyclizine, Difenhidramine,
- 15 Dimenhydrinate, Buflomedil, Amphetamine, Caffeine, Ephedrine, Orlistat, Phenylephedrine, Phenylpropanolamin, Pseudoephedrine, Sibutramin, Ketoconazole, Nitroglycerin, Nystatin, Progesterone, Testosterone, Vitamin B12, Vitamin C, Vitamin A, Vitamin D, Vitamin E, Pilocarpin, Aluminiumaminoacetat, Cimetidine, Esomeprazole, Famotidine, Lansoprazole, Magnesiumoxide, Nizatide and/or
- 20 Ratinidine or derivatives and mixtures thereof.

44. Chewing gum according to any of the claims 1-43, wherein the chewing gum is substantially free of non-biodegradable polymers.

- 25 45. Chewing gum according to any of the claims 1-44, wherein the at least two or more cyclic esters are selected from the groups of glycolides, lactides, lactones, cyclic carbonates or mixtures thereof.

46. Chewing gum according to any of the claims 1-45,
- 30 wherein lactone monomers are chosen from the group of ϵ -caprolactone, δ -valerolactone, γ -butyrolactone, and β -propiolactone. It also includes ϵ -caprolactones, δ -valerolactones, γ -butyrolactones, or β -propiolactones that have been

substituted with one or more alkyl or aryl substituents at any non-carbonyl carbon atoms along the ring, including compounds in which two substituents are contained on the same carbon atom.

- 5 47. Chewing gum according to any of the claims 1-46,
wherein the carbonate monomer is selected from the group of trimethylene
carbonate, 5-alkyl-1,3-dioxan-2-one, 5,5-dialkyl-1,3-dioxan-2-one, or 5-alkyl-5-
alkyloxycarbonyl-1,3-dioxan-2-one, ethylene carbonate, 3-ethyl-3-hydroxymethyl,
propylene carbonate, trimethylolpropane monocarbonate, 4, 6dimethyl-1, 3-
10 propylene carbonate, 2, 2-dimethyl trimethylene carbonate, and 1, 3-dioxepan-2-one
and mixtures thereof.
48. Chewing gum according to any of the claims 1- 47,
wherein cyclic ester polymers and their copolymers resulting from the
15 polymerization of cyclic ester monomers include, but are not limited to : poly (L-
lactide) ; poly (D-lactide) ; poly (D, L-lactide) ; poly (mesolactide) ; poly (glycolide)
; poly (trimethylenecarbonate) ; poly (epsilon-caprolactone) ; poly (L
lactide-co-D, L-lactide) ; poly (L-lactide-co-meso-lactide) ; poly (L-lactide
co-glycolide) ; poly (L-lactide-co-trimethylenecarbonate) ; poly (L-lactide
20 co-epsilon-caprolactone) ; poly (D, L-lactide-co-meso-lactide) ; poly (D, L
lactide-co-glycolide) ; poly (D, L-lactide-co-trimethylenecarbonate) ;
poly (D, L-lactide-co-epsilon-caprolactone) ; poly (meso-lactide-co
glycolide) ; poly (meso-lactide-co-trimethylenecarbonate) ; poly (meso
lactide-co-epsilon-caprolactone) ; poly (glycolide-cotrimethylenecarbonate) ; poly
25 (glycolide-co-epsilon-caprolactone).
49. Chewing gum according to any of the claims 1-48,
wherein the chewing gum comprises filler.
- 30 50. Chewing gum according to any of the claims 1- 49,

wherein the chewing gum comprises filler in an amount of about 0 to about 50% by weight of the chewing gum, more typically about 10 to about 40 % by weight of the chewing gum.

- 5 51. Chewing gum according to any of the claims 1-50,
wherein the chewing gum comprises at least one coloring agent.

52. Chewing gum according to any of the claims 1-51,
wherein the chewing gum is coated with an outer coating.

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53. Chewing gum according to any of the claims 1-52,
wherein the outer coating is a hard coating.

54. Chewing gum according to any of the claims 1-53,

- 15 wherein the hard coating is a coating selected from the group consisting of a sugar coating and a sugarless coating and a combination thereof.

55. Chewing gum according to any of the claims 1-54,
wherein the hard coating comprises 50 to 100% by weight of a polyol selected from
20 the group consisting of sorbitol, maltitol, mannitol, xylitol, erythritol, lactitol and isomalt.

56. Chewing gum according to any of the claims 1-55,
wherein the outer coating is an edible film comprising at least one component
25 selected from the group consisting of an edible film-forming agent and a wax.

57. Chewing gum according to any of the claims 1-56,
wherein the film-forming agent is selected from the group consisting of a cellulose derivative, a modified starch, a dextrin, gelatine, shellac, gum arabic, zein, a
30 vegetable gum, a synthetic polymer and any combination thereof.

58. Chewing gum according to any of the claims 1-57,

wherein the outer coating comprises at least one additive component selected from the group consisting of a binding agent, a moisture absorbing component, a film forming agent, a dispersing agent, an antisticking component, a bulking agent, a flavouring agent, a coloring agent, a pharmaceutically or cosmetically active component, a lipid component, a wax component, a sugar, an acid and an agent capable of accelerating the after-chewing degradation of the degradable polymer.

59. Chewing gum according to any of the claims 1-58, wherein the outer coating is a soft coating.

60. Chewing gum according to any of the claims 1-59, wherein the soft coating comprises a sugar free coating agent.

61. Chewing gum according to any of the claims 1-60, wherein said chewing gum comprises conventional chewing gum polymers or resins.

62. Chewing gum according to any of the claims 1-61, wherein the at least one biodegradable polymer comprises at least 5% of the chewing gum polymers.

63. Chewing gum according to any of the claims 1-62, wherein all the biodegradable polymers comprised in the chewing gum comprise at least 25%, preferably at least 50% of the chewing gum polymers.

64. Chewing gum according to any of the claims 1-63, wherein all the biodegradable polymers comprised in the chewing gum comprise at least 80%, preferably at least 90% of the chewing gum polymers.